Subpolar Atlantic Glider Surveys

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LONG-TERM GOALS

Our long-term goal is to understand the thermohaline circulation of the high latitude Atlantic ocean and its role in climate.

OBJECTIVES

The objective of this project is to extend knowledge of deep convection in general and Labrador and Irminger Sea circulation through the regular and deliberate survey of these regions over an annual cycle.

APPROACH

The approach is to use long range autonomous underwater glider vehicles to make regular hydrographic sections across the Labrador and Irminger Seas, including a transatlantic section. Seaglider (Eriksen et al, 2001) and Deepglider (a full ocean depth version of Seaglider now under development) vehicles will be used to make repeated hydrographic surveys across the Labrador Sea year round and to make a transoceanic section from Labrador or Newfoundland to Ireland. These sections will resolve circulation at horizontal scales of a few kilometers.

WORK COMPLETED

None. This project is in the planning stages..

RESULTS

This project is not sufficiently complete to have results.

IMPACT/APPLICATIONS

Ship-based hydrographic surveys of the subpolar Atlantic are too expensive to sample the region adequately in space and time to resolve the processes responsible for determining ocean circulation. The use of gliders will make possible fully autonomous open ocean hydrographic surveys of basic oceanographic fields (temperature, salinity, dissolved oxygen, current) at a small fraction of the cost of using ships. Gliders are expected to operate for a year for roughly the cost equivalent of one day of oceanographic research vessel time. They will be able to perform the first ever year-round surveys of high latitude hydrographic structure along a controlled grid. The same technology could be applied to other remote, harsh environment regions of the world ocean.

TRANSITIONS

None to date

RELATED PROJECTS

Deep Glider Development (N00014-02-1-0103) – A project to develop an autonomous underwater glider capable of operating at depths as great as 6000m.

REFERENCES

Eriksen, C. C., T. J. Osse, R. D. Light, T. Wen, T. W. Lehman, P. L. Sabin, J. W. Ballard, and A. M. Chiodi (2001) Seaglider: A long range autonomous underwater vehicle for oceanographic research. IEEE J. Oceanic Engineering, 26, 424-436.

PUBLICATIONS

None to date

PATENTS

None to date